Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A projection optical system having an image side numerical aperture that is greater or equal to 0.75, and which forms an image of a first object upon a second object using light of a predetermined wavelength less than or equal to 300nm, comprising:

plural optical groups having at least one lens; and

a distance D in mm along an optical axis between an optical surface closest to the second object, and the second object, satisfies a condition of $0.1 < D < 5$,

wherein the plural optical groups comprise:

a first optical group, arranged in an optical path between the first surface and the second object, having a negative power;

a second optical group, arranged in an optical path between the first optical group and the second object, having a positive power;

a third optical group, arranged in an optical path between the second optical group and the second object, having a negative power;

a fourth optical group, arranged in an optical path between the third optical group and the second object, having a positive power; and

a fifth optical group, arranged in an optical path between the fourth optical group and the second object, having a positive power.

2. (Original) A projection optical system according to claim 1, wherein the image side numerical aperture is greater than or equal to 0.8.

3. (Previously Presented) A projection optical system according to claim 1, wherein a distance L in mm along the optical axis between the first object and the second object satisfies a condition of $800 < L < 1600$.

4. (Original) A projection optical system according to claim 1, wherein at least one of a plurality of optical surfaces of the projection optical system is formed in an aspherical shape.

5. (Currently Amended) A projection optical system according to claim 1, wherein, ~~the plural optical groups is four optical groups, and~~ with T being a sum of thicknesses along the optical axis of all optical members included in the ~~fourth~~fifth optical group, and with D being the distance along the optical axis between the optical surface of the ~~fourth~~fifth optical group closest to the second object, and the second object, a condition of $0.001 < D/T < 0.2$ is satisfied.

6. (Currently Amended) A projection optical system according to claim 1, wherein, ~~the plural optical groups is four optical groups, and~~ with T being a sum of thicknesses along the optical axis of all optical members included in the ~~fourth~~fifth optical group, and with L being a distance along the optical axis between the first object and the second object, a condition of $0.02 < T/L$ is satisfied.

7. (Currently Amended) A projection optical system according to claim 1, wherein ~~the plural optical groups is four optical groups, and~~ a focal length F2 of the second optical group and a distance L in mm along the optical axis between the first object and the second object satisfy a condition of $0.01 < |F2|/L < 0.15$.

8. (Currently Amended) An exposure apparatus comprising:

an illumination system ~~for illuminating~~which is arranged in an optical path between a light source and a mask as a first object, and which illuminates the mask based on a light from the light source;

a projection optical system according to claim 1, that forms an image of a pattern which is formed upon the mask upon a photosensitive substrate as the second object; and

~~a prevention device that prevents gas which is generated from the photosensitive substrate from adhering to the optical surface of the projection optical system that is closest to the second objecta~~ flow device which is arranged near an optical path between an optical surface closest to the second object and the photosensitive substrate, and which forms a predetermined flow of fluid in the optical path between the optical surface closest to the second object and the photosensitive substrate.

9. (Cancelled)

10. (Currently Amended) An exposure method, comprising:

illuminating a mask as a first object; and

exposing, via a projection optical system according to claim 1, an image of a pattern which is formed upon the mask upon a photosensitive substrate as the second object, wherein

the exposing step comprises a flow formation process of forming a predetermined flow of ~~gas or liquid~~fluid in an optical path between the optical surface closest to the second object and the photosensitive substrate ~~in order to prevent gas which is generated from the photosensitive substrate from adhering to the optical surface closest to the second object~~.

11. (Original) A method for manufacturing a microdevice, comprising:

exposing a pattern on a mask upon a photosensitive substrate, using an exposure method according to claim 10; and

developing the photosensitive substrate which has been exposed by the exposing step.

12. (New) A projection optical system according to claim 2, wherein at least one of a plurality of optical surfaces of the projection optical system is formed in an aspherical shape.

13. (New) A projection optical system according to claim 12, wherein an optical member with an optical surface closest to the second object is made of a fluorite.

14. (New) An exposure apparatus comprising:

an illumination system which is arranged in an optical path between a light source and a mask as a first object, and which illuminates the mask based on a light from the light source;

a projection optical system according to claim 12, that forms an image of a pattern which is formed upon the mask upon a photosensitive substrate as the second object; and

a flow device which is arranged near an optical path between the optical surface closest to the second object and the photosensitive substrate, and which forms a predetermined flow of fluid in the optical path between the optical surface closest to the second object and the photosensitive substrate.

15. (New) An exposure apparatus according to claim 14, wherein the fluid comprises liquid.

16. (New) An exposure apparatus according to claim 14, wherein the fluid comprises gas.

17. (New) An exposure apparatus according to claim 14, wherein the flow device comprises a suction section which sucks the fluid from the optical path between the optical surface closest to the second object and the photosensitive substrate.

18. (New) An exposure apparatus according to claim 17, wherein the fluid comprises gas.

19. (New) An exposure apparatus according to claim 14, wherein an optical member with the optical surface closest to the second object has a plane parallel plate.

20. (New) An exposure apparatus according to claim 19, wherein the fluid comprises gas.

21. (New) An exposure apparatus according to claim 19, wherein the optical member with the optical surface closest to the second object is made of a fluorite.

22. (New) An exposure apparatus according to claim 14, wherein an optical member with the optical surface closest to the second object is made of a fluorite.

23. (New) An exposure method, comprising the steps of:

illuminating a mask as a first object; and

exposing, via a projection optical system according to claim 12, an image of a pattern which is formed upon the mask upon a photosensitive substrate as the second object,

wherein the exposing step comprises a flow formation process of forming a predetermined flow of fluid in an optical path between the optical surface closest to the second object and the photosensitive substrate.

24. (New) An exposure method according to claim 23, wherein the fluid comprises liquid.

25. (New) An exposure method according to claim 23, wherein the fluid comprises gas.

26. (New) An exposure method according to claim 23, wherein the flow formation process comprises sucking the fluid from the optical path between the optical surface closest to the second object and the photosensitive substrate.

27. (New) An exposure method according to claim 26, wherein the fluid comprises gas.

28. (New) An exposure method according to claim 23, wherein an optical member with the optical surface closest to the second object has a plane parallel plate.

29. (New) An exposure method according to claim 28, wherein the fluid comprises gas.

30. (New) An exposure method according to claim 28, wherein the optical member with the optical surface closest to the second object is made of a fluorite.

31. (New) An exposure method according to claim 23, wherein an optical member with the optical surface closest to the second object is made of a fluorite.

32. (New) An exposure apparatus comprising:

an illumination system which is arranged in an optical path between a light source and a mask as a first object, and which illuminates the mask based on a light from the light source;

a projection optical system according to claim 4, that forms an image of a pattern which is formed upon the mask upon a photosensitive substrate as the second object; and

a flow device which is arranged near an optical path between the optical surface closest to the second object and the photosensitive substrate, and which forms a predetermined flow of fluid in the optical path between the optical surface closest to the second object and the photosensitive substrate.

33. (New) An exposure apparatus according to claim 32, wherein the fluid comprises liquid.

34. (New) An exposure apparatus according to claim 32, wherein the fluid comprises gas.

35. (New) An exposure apparatus according to claim 32, wherein the flow device comprises a suction section which sucks the fluid from the optical path between the optical surface closest to the second object and the photosensitive substrate.

36. (New) An exposure apparatus according to claim 35, wherein the fluid comprises gas.

37. (New) An exposure apparatus according to claim 32, wherein an optical member with the optical surface closest to the second object has a plane parallel plate.

38. (New) An exposure apparatus according to claim 37, wherein the fluid comprises gas.

39. (New) An exposure apparatus according to claim 37, wherein the optical member with the optical surface closest to the second object is made of a fluorite.

40. (New) An exposure apparatus according to claim 32, wherein an optical member with the optical surface closest to the second object is made of a fluorite.

41. (New) An exposure method, comprising the steps of:

illuminating a mask as a first object; and

exposing, via a projection optical system according to claim 4, an image of a pattern which is formed upon the mask upon a photosensitive substrate as the second object,

wherein the exposing step comprises a flow formation process of forming a predetermined flow of fluid in an optical path between the optical surface closest to the second object and the photosensitive substrate.

42. (New) An exposure method according to claim 41, wherein the fluid comprises liquid.

43. (New) An exposure method according to claim 41, wherein the fluid comprises gas.

44. (New) An exposure method according to claim 41, wherein the flow formation process comprises sucking the fluid from the optical path between the optical surface closest to the second object and the photosensitive substrate.

45. (New) An exposure method according to claim 44, wherein the fluid comprises gas.

46. (New) An exposure method according to claim 41, wherein an optical member with the optical surface closest to the second object has a plane parallel plate.

47. (New) An exposure method according to claim 46, wherein the fluid comprises gas.

48. (New) An exposure method according to claim 46, wherein the optical member with the optical surface closest to the second object is made of a fluorite.

49. (New) An exposure method according to claim 41, wherein an optical member with the optical surface closest to the second object is made of a fluorite.

50. (New) A projection optical system according to claim 5, wherein a condition of $0.02 < T/L$ is satisfied, where L is a distance along the optical axis between the first object and the second object.

51. (New) A projection optical system according to claim 50, wherein the distance L in mm satisfies a condition of $800 < L < 1600$.

52. (New) A projection optical system according to claim 5, wherein the optical member with the optical surface closest to the second object is made of a fluorite.

53. (New) A projection optical system according to claim 6, wherein the distance L in mm satisfies a condition of $800 < L < 1600$.

54. (New) A projection optical system according to claim 53, wherein at least one of a plurality of the optical surfaces of the projection optical system is formed in an aspherical shape.

55. (New) A projection optical system according to claim 6, wherein an optical member with the optical surface closest to the second object is made of a fluorite.

56. (New) A projection optical system according to claim 7, wherein at least one of a plurality of the optical surfaces of the projection optical system is formed in an aspherical shape.

57. (New) A projection optical system according to claim 7, wherein an optical member with the optical surface closest to the second object is made of a fluorite.

58. (New) A projection optical system according to claim 1, wherein an optical member with the optical surface closest to the second object is made of a fluorite.

59. (New) An exposure apparatus according to claim 8, wherein the fluid comprises liquid.

60. (New) An exposure apparatus according to claim 8, wherein the fluid comprises gas.

61. (New) An exposure apparatus according to claim 8, wherein the flow device comprises a suction section which sucks the fluid from the optical path between the optical surface closest to the second object and the photosensitive substrate.

62. (New) An exposure apparatus according to claim 61, wherein the fluid comprises gas.

63. (New) An exposure apparatus according to claim 8, wherein an optical member with the optical surface closest to the second object has a plane parallel plate.

64. (New) An exposure apparatus according to claim 63, wherein the fluid comprises gas.

65. (New) An exposure apparatus according to claim 63, wherein the optical member with the optical surface closest to the second object is made of a fluorite.

66. (New) An exposure apparatus according to claim 8, wherein an optical member with the optical surface closest to the second object is made of a fluorite.

67. (New) An exposure method according to claim 10, wherein the fluid comprises liquid.

68. (New) An exposure method according to claim 10, wherein the fluid comprises gas.

69. (New) An exposure method according to claim 10, wherein the flow formation process comprises sucking the fluid from the optical path between the optical surface closest to the second object and the photosensitive substrate.

70. (New) An exposure method according to claim 69, wherein the fluid comprises gas.

71. (New) An exposure method according to claim 10, wherein an optical member with the optical surface closest to the second object has a plane parallel plate.

72. (New) An exposure method according to claim 71, wherein the fluid comprises gas.

73. (New) An exposure method according to claim 71, wherein the optical member with the optical surface closest to the second object is made of a fluorite.

74. (New) An exposure method according to claim 10, wherein an optical member with the optical surface closest to the second object is made of a fluorite.

75. (New) An exposure apparatus that projects an image of a mask onto a photosensitive substrate, comprising:

a light source;

an illumination system which is arranged in an optical path between the light source and a first surface at which the mask is set, and which illuminates the mask with a light of a predetermined wavelength less than 300 nm; and

a projection optical system which is arranged in an optical path between the first surface and a second surface at which the photosensitive substrate is set, and which forms the image of the mask onto the photosensitive substrate with the light of the predetermined wavelength less than 300 nm,

the projection optical system comprises an image side numerical aperture that is greater than or equal to 0.75, and plural optical groups having at least one lens, and a distance D in mm along an optical axis between an optical surface closest to the second surface and the second surface, satisfies a condition of $0.1 < D < 5$,

wherein the plural optical groups comprise:

a first optical group, arranged in an optical path between the first surface and the second surface, having a negative power;

a second optical group, arranged in an optical path between the first optical group and the second surface, having a positive power;

a third optical group, arranged in an optical path between the second optical group and the second surface, having a negative power;

a fourth optical group, arranged in an optical path between the third optical group and the second surface, having a positive power; and

a fifth optical group, arranged in an optical path between the fourth optical group and the second surface, having a positive power,

the exposure apparatus further comprising:

a flow device which is arranged near an optical path between the optical surface closest to the second surface and the photosensitive substrate, and which forms a predetermined flow of fluid in the optical path between the optical surface closest to the second surface and the photosensitive substrate.

76. (New) An exposure apparatus according to claim 75, wherein the fluid comprises liquid.

77. (New) An exposure apparatus according to claim 75, wherein the fluid comprises gas.

78. (New) An exposure apparatus according to claim 75, wherein the flow device comprises a suction section which sucks the fluid from the optical path between the optical surface closest to the second surface and the photosensitive substrate.

79. (New) An exposure apparatus according to claim 78, wherein the fluid comprises gas.

80. (New) An exposure apparatus according to claim 78, wherein the image side numerical aperture is greater than or equal to 0.8.

81. (New) An exposure apparatus according to claim 80, wherein at least one of a plurality of optical surfaces of the projection optical system is formed in an aspherical shape.

82. (New) An exposure apparatus according to claim 81, wherein the optical member with the optical surface closest to the second surface is made of a fluorite.

83. (New) An exposure apparatus according to claim 80, wherein, with T being a sum of thicknesses along the optical axis of all optical members included in the fifth optical group, and with D being the distance along the optical axis between the optical surface of the fifth optical group closest to the second surface, and the second surface, a condition of $0.001 < D/T < 0.2$ is satisfied.

84. (New) An exposure apparatus according to claim 83, wherein a condition of $0.02 < T/L$ is satisfied, where L is a distance along the optical axis between the first surface and the second surface.

85. (New) An exposure apparatus according to claim 84, wherein the distance L in mm satisfies a condition of $800 < L < 1600$.

86. (New) An exposure apparatus according to claim 75, wherein an optical member with the optical surface closest to the second surface has a plane parallel plate.

87. (New) An exposure apparatus according to claim 86, wherein the fluid comprises gas.

88. (New) An exposure apparatus according to claim 86, wherein the optical member with the optical surface closest to the second surface is made of a fluorite.

89. (New) An exposure apparatus according to claim 75, wherein an optical member with the optical surface closest to the second surface is made of a fluorite.

90. (New) An exposure method for projecting an image of a mask onto a photosensitive substrate, comprising:

illuminating the mask with a light of a predetermined wavelength less than 300 nm; and

projecting, via a projection optical system, the image of the mask which is set at a first surface onto the photosensitive substrate which is set at a second surface, with the light of the predetermined wavelength less than 300 nm,

wherein the projection optical system comprises an image side numerical aperture that is greater than or equal to 0.75, and plural optical groups having at least one lens, and a distance D in mm along an optical axis between an optical surface closest to the second surface and the second surface, satisfies a condition of $0.1 < D < 5$,

wherein the plural optical groups comprise:

a first lens group, arranged in an optical path between the first surface and the second surface, having a negative power;

a second lens group, arranged in an optical path between the first lens group and the second surface, having a positive power;

a third lens group, arranged in an optical path between the second lens group and the second surface, having a negative power;

a fourth lens group, arranged in an optical path between the third lens group and the second surface, having a positive power; and

a fifth lens group, arranged in an optical path between the fourth lens group and the second surface, having a positive power,

the exposure method further comprising:

a flow formation step of forming a predetermined flow of fluid in an optical path between the optical surface closest to the second surface and the photosensitive substrate.

91. (New) An exposure method according to claim 90, wherein the fluid comprises liquid.

92. (New) An exposure method according to claim 90, wherein the fluid comprises gas.

93. (New) An exposure method according to claim 90, wherein the flow formation step comprises sucking the fluid from the optical path between the optical surface closest to the second surface and the photosensitive substrate.

94. (New) An exposure method according to claim 93, wherein the fluid comprises gas.

95. (New) An exposure method according to claim 93, wherein the image side numerical aperture is greater than or equal to 0.8.

96. (New) An exposure method according to claim 95, wherein at least one of a plurality of optical surfaces of the projection optical system is formed in an aspherical shape.

97. (New) An exposure method according to claim 96, wherein an optical member with the optical surface closest to the second surface is made of a fluorite.

98. (New) An exposure method according to claim 95, wherein, with T being a sum of thicknesses along the optical axis of all optical members included in the fifth lens group, and with D being the distance along the optical axis between the optical surface of the fifth lens group closest to the second surface, and the second surface, a condition of $0.001 < D/T < 0.2$ is satisfied.

99. (New) An exposure method according to claim 98, wherein a condition of $0.02 < T/L$ is satisfied, where L is a distance along the optical axis between the first surface and the second surface.

100. (New) An exposure method according to claim 99, wherein the distance L in mm satisfies a condition of $800 < L < 1600$.

101. (New) An exposure method according to claim 90, wherein an optical member with the optical surface closest to the second surface has a plane parallel plate.

102. (New) An exposure method according to claim 101, wherein the fluid comprises gas.

103. (New) An exposure method according to claim 101, wherein the optical member with the optical surface closest to the second surface is made of a fluorite.

104. (New) An exposure method according to claim 90, wherein an optical member with the optical surface closest to the second surface is made of a fluorite.

105. (New) A projection optical system that projects an image of a first surface onto a second surface, comprising:

a first lens group, arranged in an optical path between the first surface and the second surface, having a negative power;

a second lens group, arranged in an optical path between the first lens group and the second surface, having a positive power;

a third lens group, arranged in an optical path between the second lens group and the second surface, having a negative power;

a fourth lens group, arranged in an optical path between the third lens group and the second surface, having a positive power; and

a fifth lens group, arranged in an optical path between the fourth lens group and the second surface, having a positive power,

wherein an optical path between the fifth lens group and the second surface is filled with a liquid, and

wherein a diameter of a light beam which passes the projection optical system is a relative maximum in a region between the fourth lens group and the fifth lens group.

106. (New) A projection optical system according to claim 105, further comprising an image side numerical aperture that is greater than or equal to 0.8.

107. (New) A projection optical system according to claim 106, wherein the fifth lens group comprises at least four positive lenses.

108. (New) A projection optical system according to claim 107, wherein the first lens group comprises at least one optical surface formed in an aspherical shape.

109. (New) A projection optical system according to claim 108, wherein the third lens group comprises at least one optical surface formed in an aspherical shape.

110. (New) A projection optical system according to claim 106, wherein the first lens group comprises at least one optical surface formed in an aspherical shape.

111. (New) A projection optical system according to claim 106, wherein the third lens group comprises at least one optical surface formed in an aspherical shape.

112. (New) A projection optical system according to claim 105, wherein the first lens group comprises at least one optical surface formed in an aspherical shape.

113. (New) A projection optical system according to claim 112, wherein the third lens group comprises at least one optical surface formed in an aspherical shape.

114. (New) A projection optical system according to claim 113, wherein the second lens group comprises at least four consecutive positive lenses.

115. (New) A projection optical system according to claim 114, wherein the fifth lens group comprises at least four positive lenses.

116. (New) A projection optical system according to claim 112, wherein the third lens group comprises at least one optical surface formed in an aspherical shape.

117. (New) A projection optical system according to claim 116, wherein the second lens group comprises at least four consecutive positive lenses.

118. (New) A projection optical system according to claim 105, wherein the second lens group comprises at least four consecutive positive lenses.

119. (New) A projection optical system according to claim 105, wherein the second lens group comprises a first meniscus lens with a concave lens surface facing toward the first surface side, and a second meniscus lens with a concave lens surface facing toward the second surface side.

120. (New) A projection optical system according to claim 105, wherein the second lens group comprises a first meniscus lens with a concave lens surface facing toward the first surface side, a biconvex lens, and a second meniscus lens with a concave lens surface facing toward the second surface side.

121. (New) A projection optical system according to claim 105, wherein all lenses of the third lens group are negative lenses.

122. (New) A projection optical system according to claim 121, wherein the third lens group comprises at least one optical surface formed in an aspherical shape.

123. (New) A projection optical system according to claim 105, wherein two oppositely curved, concave surfaces directly opposed to one another in the third lens group are surround by two concave surfaces which are concave relative to one another.

124. (New) A projection optical system according to claim 105, wherein an exit region, facing the third lens group, of the second lens group, and an entry region, following the third lens group, of the fourth lens group, are constructed substantially symmetrically relative to a plane of symmetry lying inside the third lens group.

125. (New) A projection optical system according to claim 105, wherein a doublet is arranged near a region between the fourth lens group and the fifth lens group, wherein the doublet has a biconvex positive lens and a negative meniscus lens with lens surfaces which are concave toward the second surface.

126. (New) A projection optical system according to claim 105, wherein a first surface side entry region of the fourth lens group has at least one positive meniscus lens, concave relative to the first surface side.

127. (New) A projection optical system according to claim 105, wherein the fifth lens group comprises at least four positive lenses.

128. (New) A projection optical system according to claim 127, wherein a doublet is arranged near a region between the fourth lens group and the fifth lens group, and the doublet has a biconvex positive lens and a negative meniscus lens with lens surfaces which are concave toward the second surface.

129. (New) A projection optical system according to claim 105, wherein the fifth lens group comprises at least one positive meniscus lens with a concave surface facing toward the second surface side.

130. (New) A projection optical system according to claim 105, wherein the fifth lens group comprises a plano-convex lens which has an entry surface and a substantially flat exit surface.

131. (New) A projection optical system according to claim 130, wherein the plano-convex lens is constructed in a non-hemispherical fashion.

132. (New) A projection optical system according to claim 105, wherein all lenses consist of the same material.

133. (New) An exposure apparatus comprising:

an illumination system which is arranged in an optical path between a light source and a mask and which illuminates the mask based on a light from the light source; and

a projection optical system according to claim 105, that forms an image of a pattern on the mask onto a photosensitive substrate.

134. (New) An exposure method, comprising the steps of:

illuminating a mask; and

exposing, via a projection optical system according to claim 105, an image of a pattern on the mask onto a photosensitive substrate.

135. (New) An exposure apparatus comprising:

an illumination system which is arranged in an optical path between a light source and a mask and which illuminates the mask based on a light from the light source; and

a projection optical system according to claim 109, that forms an image of a pattern on the mask onto a photosensitive substrate.

136. (New) An exposure method, comprising the steps of:

illuminating a mask; and

exposing, via a projection optical system according to claim 109, an image of a pattern on the mask onto a photosensitive substrate.

137. (New) A projection optical system according to claim 1, further comprising an additional lens group with a positive power which is arranged in an optical path between the first object and the first optical group.

138. (New) An exposure apparatus according to claim 75, wherein the projection optical system further comprises an additional lens group with a positive power which is arranged in an optical path between the first surface and the first optical group.

139. (New) An exposure method according to claim 90, wherein the projection optical system further comprises an additional lens group with a positive power which is arranged in an optical path between the first surface and the first lens group.

140. (New) A projection optical system according to claim 105, further comprising an additional lens group with a positive power which is arranged in an optical path between the first surface and the first lens group.